

30 MAR 1959

MEMORANDUM FOR THE RECORD:

SUBJECT: BEACON REQUIREMENTS:

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The Technical Requirements Board have stated general characteristics for a drop zone beacbn. Paper dated 26 February 1959. The following notes are written so as to provide a comparision of the Sarah system with the desired requirements.

A. General characteristics.

1. Desired range; 15 miles at 200-300 feet.

The best results obtained with Sarah have indicated 6 to 8 miles at 300'. In an area without obstructions this constitutes about the optimum for any line of sight system.

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2. Transmit a minimum amount of signal.

Sarah meets this requirement better than many current systems due to the fact it is pulsed.

3. Operates without visual reference to the ground.

4. Reasonably free of local interference or jamming. Any operation must be planned with minimum time requirements for beacon operation. Sarah is consistent with other systems in this regard.

5. Limited emission consistent with range requirements. Generally speaking the longer the range the higher the power output requirements. This leads to larger sets, batteries, etc. Sarah is consistent with the other portable beacons in this respect.

B. Airborne equipment requirements.

1. Weight 50 pounds. Sarah meets this requirement.

2. Minimal signal from the aircraft. Sarah does not transmit. Accuracy of 10% in residual range should be met by Sarah however no indication of residual range to be flown or azimuth is indicated in the a/c. The Mk 220 beacon does provide a null warning and a null when over the station.

3. Visual signal indicating range and azimuth. Sarah does not provide.

4. High reliability. All systems employing multiple antenna for reception of signal and directional indications are very sensitive (critical) as far as installation is concerned. Reliability of Sarah is also a problem at the extremes of distance required.

C. Ground equipment requirements.

1. Readily carried by one person. The Sarah Mk 220 beacon is not readily carried by one person due to the 6 volt wet

battery

required. Portable powered beacons with and without trans-
isorized power units and using mercury batteries are presently
under test.

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3. Weight under 10 pounds. The portable beacons with mercury
batteries satisfy this requirement. The Mk 220, however complete
with battery would weigh close to 20 pounds. This is an approx-
imation.

4. Battery life must exceed 10 hours. The Sarah portable beacon
power packs are good for about 20 hours. The Mk 220 battery (wet)
is limited to about 5 hours. Shelf life of the mercury batteries
is good and would meet these requirements, (6 months), however
the Mk 220 wet battery could not satisfy the 6 months shelf life
requirement.

5. See 4 above.

6. Limited emission consistent with range requirements. Sarah
would be consistent with other systems regarding signal emission.

7. Not listed.

8. Adaptable to hot, cold, humid climate. Mercury batteries lose
considerable effective output in temperatures below 40 degrees F.
If they can be kept warm prior to use, such as nesting on the body
this would facilitate their use in lower temperatures. Warm and
humid temperatures are not ~~the~~ problem.

9. Simple to erect and operate. This should not be a problem with
Sarah beacons however the Mk 220 beacon would require a little prior
instruction.

10. High degree of reliability and accuracy. Sarah does not provide
a high degree of reliability and accuracy as far as our present ex-
perience factors indicate. As discussed above, the problems of an-
tenna installation are critical, low altitude reception of the signal
is dependent upon terrain, position of the beacon, trees etc. This
is true of any line of sight system.

11. Should meet CIA standards of sterility. Not a problem.

12. Voice transmission optional, simple coding system desirable.
Possibly an identification code could be incorporated. This will
be investigated.

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